

Notice of Allowability

Application No.

10/731,480

Examiner

DuyVu n. Deo

Applicant(s)

CHO, IHL HYUN

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application filed 12/10/03.
2. ☒ The allowed claim(s) is/are 1-5.
3. ☒ The drawings filed on 10 December 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 12/10/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Primary Examiner
Duy-Vu N. Deo
8/22/05

Allowable Subject Matter

1. The following is an examiner's statement of reasons for allowance:

The prior art doesn't describe or suggest the limitations of the claimed invention.

Claim 1. A method of forming a metal line in a semiconductor device, comprising the steps of: sequentially forming a first etch stop film, a second interlayer insulating film, a second etch stop film and a third interlayer insulating film on a first interlayer insulating film into which a metal line is buried; forming a first photoresist pattern defining a via hole in a given region of the third interlayer insulating film; performing an etch process using the first photoresist pattern as an etch mask up to the first etch stop film to form the via hole; and then removing the first photoresist pattern; forming a BARC film on the resulting surface and then forming a second photoresist pattern defining the metal line in another given region of the BARC film; *performing an etch process using the second photoresist pattern as an etch mask up to the second etch stop film to form a metal line trench; and then removing the second photoresist pattern and the BARC film by means of a first wet etch process; etching the first etch stop film by means of a second wet etch process using the second interlayer insulating film as an etch mask; and cleaning the resulting entire surface by means of a third wet etch process.*

Claim 5. A method of forming a metal line in a semiconductor device, comprising the steps of: sequentially forming a first etch stop film, a second interlayer insulating film and a BARC film on a first interlayer insulating film into which a metal line is buried; forming a photoresist pattern defining a trench in a given region of the BARC film; *performing an etch process up to the second interlayer insulating film using the photoresist pattern as an etch mask to form a trench; removing the photoresist pattern and the BARC film by means of a first wet etch*

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process, etching the first etch stop film by means of a second wet etch process using the second interlayer insulating film as etch mask, and cleaning the resulting entire surface by means of a third wet etch process.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n. Deo whose telephone number is 571-272-1462. The examiner can normally be reached on 6:00-2:30 Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Primary Examiner

Duy-Vu N. Deo

8/22/05

